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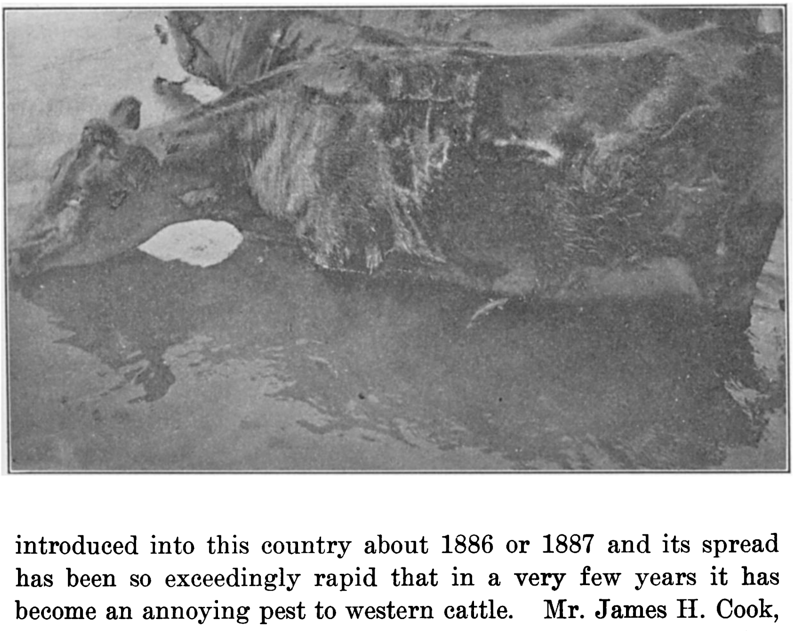
SHORTER ARTICLES AND DISCUSSION

THE CHUB AND THE TEXAS HORN FLY

In the upper reaches of the waters of the Niobrara River, locally known as Running Water, the common chub, *Semotilus atromaculatus*, is very abundant. One may with a hook and line secure many dozens of them in a very short time. In Running Water they scarcely ever attain a greater length than eight inches. During the past summer while out on a collecting trip into the Miocene beds of northwestern Nebraska, some interesting observations were made on certain feeding habits of the chub which may prove of interest to those naturalists who are especially interested in animal behavior and intelligence.

The horn fly, *Hæmatobia serrata,* according to Kellogg, is a European insect which gets its popular name from the habit of clustering on the bases of the horns of cattle. It was first introduced into this country about 1886 or 1887 and its spread has been so exceedingly rapid that in a very few years it has become an annoying pest to western cattle. Mr. James H. Cook, a prominent ranchman of Sioux County, Nebraska, told me that



he had never seen the horn flies so abundant as they were the past summer. They literally swarmed around the cattle and since the majority of the stock was dehorned the insects would settle all over the backs and sides of the animals although they were in some cases observed to cluster around the horn bases.

At Harris's ford, where the collecting parties crossed Running Water, several hundred cattle watered all summer. The lower part of the ford is quite shallow, scarcely attaining a depth of more than a foot; somewhat to the right the water deepened so that the cattle in drinking would be submerged nearly to the middle line of their bodies. At noon the cattle would begin to come to water and would continue coming for some hours on hot days; on cooler days they would delay their coming somewhat; and on rainy days they frequently did not come at all. The following observations were made on hot, bright days as our party was returning to camp from the morning work. Mr. Albert Thomson called my attention to the actions of the fishes and we together made the following observations repeatedly.

The cattle would almost always enter the stream at the shallow part of the ford and gradually wade up stream, drinking as they went, until they came to the deep place near the fence where the water reached well up on their bellies. The chubs seemed to be unusually numerous at the ford, and we often wondered at the great numbers of the little fishes which we could see in schools in the clear water. Their presence was soon explained. As soon as the cattle entered the stream at the shallow place in the ford the chubs would come out from their cool and shady retreats under the grasses along the sides of the bank and hasten to meet the cattle at the shallows. Often we saw as many as a dozen or more chubs following a single cow. As soon as the water came near the bellies of the animals the chubs would leap out of the water and catch the horn flies from the sides of the cattle. Often we saw them leap as much as half their length out of the water to secure a fly which was high up on the animal's side. These observations were made on several consecutive days, and on the last day but one I was so fortunate as to secure a photograph of a chub in the act of catching a fly from the side of a cow and the photograph is published herewith.

That the fishes actually learned that the dark spots on the sides of the cattle made good food, there can be no doubt. Just how they first learned it we may not know. The chubs had further learned that the coming of the cattle meant food for them, hence they would meet the cattle in the shallows and follow them to deeper water. The act of these fishes leaping to secure flies from the sides of cattle is so unusual that it is deemed worthy of notice and it is hoped that the incident may be of service to those interested in animal behavior.

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NOTICE OF A NEW CAMEL FROM THE LOWER MIOCENE OF NEBRASKA

In the autumn of 1906, the writer found a nearly complete skeleton of a camel, in the Lower Harrison Beds, near Agate, Sioux County, Nebraska. The skeleton is finely preserved and articulated. It had apparently been washed into a heap while the muscles still held the bones together, for it is literally tied in knots. On this account it has only been partly removed from the matrix, and so a complete description is deferred.

The type (No. HC125, private collection of the writer) is an adult animal, and consists of a complete skull and jaws, a practically complete vertebral series, fore limbs and feet, pelvis, sacrum, and the greater portion of the hind limbs and feet. The latter were damaged by erosion. It is referred to the genus Oxydactylus, and the specific name of *Campestris* is proposed.

It is apparently closely related to *O. longipes,*[1] but is a much smaller and somewhat less specialized type. This seems the more natural when we remember that *O. longipes* was found in a somewhat later horizon. The skull in general contour is very similar to *O. longipes*, but exhibits some distinct features. The upper incisors are proportionally slightly larger than those of *O. longipes,* the third incisor being a little larger than the canine. The diastema separating these two teeth is relatively shorter than in the latter, and the facial portion of *O. campestris* is relatively shorter. The premaxillae are separated at the proximal extremity by an unusually large U-shaped opening, 8 mm. wide and 10 mm. long. P^2 and P^3 are slightly more robust in the present species. The limbs are long and slender, though much shorter than those of *O. longipes.* The metacarpals are entirely separate. On the sides of the proximal end

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[1] *Annals of the Carnegie Museum,* Vol. II, No. 3, pp. 434–475, 1904.